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# THE Journal of the Society of Arts,

## AND OF THE INSTITUTIONS IN UNION.

111TH SESSION.]

FRIDAY, JUNE 30, 1865.

[No. 658. Vol. XIII.]

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### Proceedings of the Society.

#### ANNUAL GENERAL MEETING.

The Annual General Meeting for receiving the Report from the Council, and the Treasurer's Statement of Receipts, Payments, and Expenditure during the past year, and also for the Election of Officers, was held, in accordance with the Bye-laws, on Wednesday, the 28th inst., at 4 p.m. WILLIAM HAWES, Esq., Chairman of the Council, presided.

The Secretary having read the notice convening the Meeting, the minutes of the last Annual General Meeting, and of the subsequent Special General Meeting, were read and signed.

The Chairman then nominated Mr. C. Stuart Barker and Mr. Purling as Scrutineers, and declared the ballot open.

The Secretary then read the

#### ANNUAL REPORT OF THE COUNCIL.

The Council, as required by the bye-laws, now lay before the members at the Annual General Meeting the report of the proceedings of the past year.

#### CANTOR LECTURES.

These Lectures, which were tried with so much success last session, have been renewed in the present year. Three courses were selected, bearing on the objects of the Society, namely :—

“On the Reproduction of Natural Forms by Art and Manufacture.” Five Lectures, by B. Waterhouse Hawkins, Esq., F.G.S., F.L.S.

“On the Application of Geology to the Arts and Manufactures.” Six Lectures, by Professor D. T. Ansted, M.A., F.R.S.

“On the Application of Chemistry to the Arts and Manufactures.” Six Lectures, by Dr. F. Grace Calvert, F.R.S. Abstracts of the first two courses of these lectures have already appeared in the Society's *Journal*, and full re-

ports of Dr. Calvert's lectures, carefully revised by himself, will shortly be published.

The interest taken in these lectures has in no way diminished, as is abundantly testified by the increasing numbers attending them, even though it was found necessary to curtail the privilege of members to the admission of one friend instead of two, as was the case last year. While this interest continues to be maintained, the Council feel that they cannot do better than make arrangements for carrying on in the next session this branch of the Society's work. In the selection of the subjects and the lecturers it will be the endeavour of the Council to bring before the members of the Society information with regard to Arts and Manufactures which will tend to diffuse a love of Art, and promote a spirit of inquiry among those interested in the numerous industries of the country.

#### MEDALS AND PRIZES.

The success attendant on the offer of the Art-Workmanship Prizes of last year, induced the Council to renew the competition on a larger scale. Money prizes to the extent of upwards of £500 were offered for competition among the art-workmen of the kingdom, in eighteen different branches of manufacture, and in wood carving. The particulars have already appeared in the *Journal*. Eighty-seven different works were sent in in competition, and were exhibited in the Society's rooms for a few weeks at Christmas. The Council were fortunate enough to secure the services of Messrs. R. Redgrave, R.A., M. Digby Wyatt, and John Webb as adjudicators; and prizes to the extent of £274 were awarded to 37 competitors.

A large meeting of Art-workmen was held in the Society's rooms, by invitation from the Council, with the view of conferring with the workmen themselves upon the system of Art-workmanship competitions instituted by the Society, and receiving suggestions for carrying

them out more effectually. On this occasion it was stated that a larger number of competitors would have come forward had it not been that the workmen in all branches of manufactures had been unusually occupied in their various employments, and thus but little time was left at their own disposal to devote to these works after their hours of labour. At the meeting above alluded to there was strong and unanimous evidence afforded on all sides that the course the Society was pursuing was right, and the Council, acting upon that opinion, have this year renewed the competition on a still more extended scale; prizes are now offered to the amount of above £600, the articles to be sent in to the Society's house in December next.

Looking at the objects for which the various ancient Companies in the City of London were established, the Council thought it right to seek their co-operation in carrying out this scheme for the improvement of the Arts and Manufactures of the United Kingdom. The Worshipful Company of Salters at once placed an annual sum of £10 at the disposal of the Council to be applied in such way as they might think best for promoting the object in view; and the Worshipful Company of Plasterers within the last few days, with a desire to benefit the Art which they represent, have placed at the disposal of the Council one prize of £10, and a second prize of £5, for modelling, to be awarded by the Society under the same conditions as the other Art-workmanship Prizes. The Council have taken steps for making the competition known as widely as possible among workmen, not only in the metropolis but in the great centres of industry of the kingdom, such as Birmingham, Sheffield, the Potteries, &c. It is confidently expected that as the scheme becomes more generally known the response by competitors will increase from year to year, and that at Christmas next the members may expect to see a large number of works exhibited.

For the papers read during the Session medals have been respectively awarded to Mr. J. C. Morton, for his paper "On London Sewage, from an agricultural point of view;" to Mr. W. Stones, for his paper "On Colonisation, its aspects and results;" and to Professor John Coleman, for his paper "On Food for Cattle."

The Albert Gold Medal, founded as a memorial of His Royal Highness the late President of the Society, has been awarded to His Imperial Majesty the Emperor of the French for distinguished merit in promoting in many ways, by his personal exertions, the international progress of Arts, Manufactures, and Commerce, the proofs of which are afforded by his judicious patronage of Art, his enlightened commercial policy, and especially by the abolition of passports

in favour of British subjects. His Royal Highness the President has himself communicated this decision to the Emperor, by whom it has been most graciously received.

Sir W. C. Trevelyan's Prize of £70 for a method of preserving meat, has not yet been awarded. This subject is one of great importance. It is attracting much attention at the present time, and a number of processes, founded on various scientific principles, are being practically put into operation. Some of them have been before the Society, and hold out promise of good results, but hitherto the specimens have not been subjected to a sufficiently lengthened test to warrant the prize being awarded in favour of any one process.

#### DWELLINGS FOR THE LABOURING CLASSES.

This subject, it will be remembered, occupied the attention of a Conference in May last year, invited by the Council to discuss it in all its bearings. That Conference lasted two days, was well attended, and after passing a series of resolutions embodying its views, recommended that the matter should be placed in the hands of a committee, who should endeavour to deal with it in a practical manner so far as was possible. Accordingly the Council, on the commencement of the past session, appointed a committee, presided over by the Chairman of the Council, and consisting of a number of gentlemen well known for the interest they have taken in the subject, and practically acquainted with it in all its bearings, both in town and country. This committee has held many meetings, all well attended, and has obtained much statistical and other information bearing on the question. They also visited, in company with Alderman Waterlow, the various improved dwellings which have of late been built, and are still building, in the metropolis. At their first meeting they divided their discussions into the following heads:—

1. The causes which appear to retard the erection of proper house accommodation, and the improvement of existing houses, for the working classes in town and country.
2. The operation of imperial and local taxation on such dwellings; and the expediency of relieving them from all or a portion of such taxation.
3. The effect of the law of settlement and removal of the poor upon such buildings in country districts.
4. The probable effect of extending the area of local taxation in town and country.
5. The operation of the laws relating to the transfer of real property in small plots, and the conveyance of chambers and *suites* of rooms.
6. The operation of the destruction of houses by railways and other local improvements.
7. The desirability of facilitating the conveyance of labourers to and from their works by railway.
8. Whether the provisions contained in the existing Acts of Parliament, for granting loans for the improvement of estates, might not be extended to the building of cottages, and if so under what special conditions.
9. Whether the provisions of the common lodging-

house act, and other statutes relating to the public health might not be advantageously extended.

10. Whether there are any other means by which the legislature can promote the object in view.

The Committee in May last presented their report. It appeared from reliable evidence brought before them that the great cause which retarded the erection of good and improved dwellings for the labouring classes was, that they were not commercially remunerative, and therefore would not attract capital to be expended on their construction, though they might pay a per centage on their outlay equal to the ordinary rate of interest on investments, and which might satisfy the philanthropist.

As regards the burdens which have been generally supposed to press heavily on this class of property, the Committee, after investigating the accounts of a considerable number of dwellings of this character found that the total amount of taxation from all sources does not exceed  $1\frac{1}{2}$  per cent. on the whole capital invested, an amount which (even if the exemption from the whole of such taxation were practicable) is too small to exercise any appreciable influence on those contemplating the investment of capital in an undertaking of this nature. Under these circumstances, and considering the violation of sound principles involved in making any exemption in favour of any particular class of house property, the Committee did not feel justified in proposing the adoption of any measure of exemption.

The house duty may be usually avoided in blocks of buildings whose size would otherwise make them liable to it, by giving to each set of apartments a door opening to the external air, and making them thereby a distinct tenement.

The Committee recognise the importance of Union rating as affecting materially the erection of cottages in the country, as well as of Mr. Villiers' Act for enlarging the area of settlement. It did not appear that this question would have any material bearing on such dwellings in the metropolis. The law of real property, as affecting the purchase, sale, and transfer of property of this kind, was taken into consideration, and the Committee agreed in the expediency of greater facilities being given by law both for acquiring sites and for transfer from owner to owner. The Exchequer Loan Commissioners have power now, under the Enclosure Acts, to advance money under certain conditions to landowners for the building of cottages on estates in the country, but it does not appear that such loans can be made to aid in the erection of town dwellings, and the Committee are of opinion that facilities should be given for this being done. The demolition of dwellings by railways occupied the attention of the Committee, and they arrived at the conclusion that where public companies, under compulsory powers, destroy houses inhabited by the working classes, they

ought to be compelled to provide sufficient improved dwellings within a convenient distance for the same classes in place of those destroyed, and should have special powers given them for that purpose; the Committee expressed their decided opinion that it would be for the benefit of the community at large that all the metropolitan railway companies should provide cheap means of transit, at convenient times, for labourers; but they hesitated to recommend that this should be made compulsory in all cases, believing that if their views of the results likely to arise from such accommodation to the working classes were correct, the directors of the railway companies would not fail to adopt them.

The importance of further powers being given to enforce sanitary regulations on the owners and inhabitants of this class of property was pointed out by the Committee, and they recommend that a concise analysis of the sanitary laws should be prepared, and that the defects of the existing enactments should be printed and circulated. In this way the attention of men of education and intelligence would be called to the subject, and they might be induced to take part in sanitary work in the neighbourhood in which they reside or carry on business.

The Committee conclude their report by making the following recommendations to the Council:—

1. That corporations, limited owners, &c., should have increased power to sell land for the erection of dwellings for labourers, under conditions as to proper drainage, ventilation, and sanitary regulations.

2. That the public loan commissioners should be authorised to lend money, at a rate not exceeding  $3\frac{1}{2}$  per cent. per annum, for building dwellings for the labouring classes, under suitable guarantees and with due regard to sanitary arrangements.

3. That in all future railway acts, and acts for local improvements, when houses inhabited by the working classes are destroyed under compulsory powers, such companies should be compelled to provide, within a convenient distance, other dwellings in lieu of those destroyed.

That the following amendments should be made in our sanitary laws:—

a. That the appointment of inspectors of nuisances throughout the country should be compulsory.

b. That increased power be given to the proper local authorities, to oblige builders of houses to provide adequate drainage and ventilation.

c. That the medical officers of health should be irremovable without the consent of the Privy Council, and that the amount of their salaries should be subject to the approval of the same authority.

d. That houses in which lodgers are taken, especially where particular rooms in a house are overcrowded, should be brought under more efficient inspection.

5. That with the view of extending an accurate knowledge of the powers contained in the various acts relating to the removal of nuisances, the Council is recommended to prepare and publish a concise analysis of the existing law, calling the attention of the educated classes to this important subject, and pointing out how they may, merely by a little attention and exertion, confer most important benefits upon a large mass of working people and upon the country generally.

The Council are now taking steps for getting these recommendations carried into effect, and in reply to their application made to Her Majesty's Government have received a communication from the Lords of the Treasury that their lordships are willing and intend to apply to Parliament for power to enable them to grant loans of public money for the erection of dwellings for the labouring classes on condition that the public bodies undertaking their erection limit their rate of profit to £5 per cent., so as to distinguish their case from that of ordinary commercial enterprise. The details of the report have already been printed in the *Journal*.

#### MUSICAL EDUCATION.

A committee has been appointed to consider the condition of musical education in this country and abroad, and His Royal Highness the President honoured the Committee by consenting to accept the chairmanship of it, and proposes to give the subject his attention when the evidence is laid before him. The committee has already held several sittings, and has taken the evidence of several eminent men in this branch of the Fine Arts. With the aid of the Government, through the agency of Her Majesty's Ministers in foreign countries, information of an extremely useful character has been received in reference to the musical establishments in the leading continental cities. It is intended to print this information, as well as the evidence given before the committee, in the *Journal*. The Council believe it will be of interest to the members, and have hopes that, through the influence of the Society, measures for promoting Musical Education may be adopted in this country as effective as those in Paris and other Continental cities.

#### UNION OF INSTITUTIONS.

The Secretary's report, read to the Conference of representatives of Institutions held on the 14th inst., shows the position of this branch of the Society's operations. By this it appears that there is no diminution of candidates, the numbers attending the Examinations of the Society increasing from year to year.

#### FINANCE.

The accounts, showing the financial position of the Society, were published, as directed by the bye-laws, in the *Journal* of last week. By these it appears that the extraordinary liabilities at the close of the last year have all been discharged. Thus it will be seen that the heavy expenditure due to the renewal of the Society's lease, the alterations and repairs of the premises, and the publication of the Jury Reports, amounting to above £6,000, have been discharged out of the income of the Society, with the exception of £545 borrowed of the memorial fund, and the sale of stock to the value of

£1,600; while the ordinary liabilities of the Society in current accounts remain as usual. The number of members continues steadily to increase.

The Treasurers' statement of receipts, payments, and expenditure for the year ending 31st May, 1865, as published in the *Journal* last week, was read by the Secretary.

The CHAIRMAN asked whether any member present required any further information, or wished to offer any observations either upon the accounts or on the general proceedings of the Society, on which

Mr. T. H. HARTLEY said, that early in the Session he called the attention of the Society to the subject of the scarcity of skilled labour in this country. The importance of that question was becoming more and more apparent from the great inconvenience which manufacturers were put to, and he thought it was a matter which should be discussed by the Society, and with that view he had sent a communication to the Society for the consideration of the Council. It was evident that unless some means were taken to a greater extent than had yet been done to train the youth of this country to skilled occupations, our manufacturers would be obliged to depend mainly upon foreigners. It was the case that in his own branch of business—the working of marble—he was obliged to depend a good deal upon foreign workmen, from the great scarcity of native skilled labour. At the same time there were great numbers of youths now confined in prisons and reformatories, who, if turned out from thence as skilled workmen, would be of great service to the state, instead of being a constant burden upon it. He was not aware of any society which was so well adapted to take up this question as the Society of Arts, being one cognate to its objects in the encouragement of arts and manufactures. The present state of the law with regard to apprentices was such as to discourage masters from taking them, and thus the great source of supply of skilled labour was, to a considerable extent, cut off. There was no other means of continuing that supply except by training the youth of the country, so as to replace the skilled workmen who died off. Another effect of the present state of things was that business suffered and wages were increased to an enormous extent. He always desired to see the workman well paid, but he had no doubt that if things went on in their present course wages would soon rise to 10s. per day. He begged to press this subject upon the attention of the Council. The training of workmen was carried to the greatest extent on the Continent. In Denmark, Sweden, and Prussia, it was made compulsory that youths of a certain age should be apprenticed to some branch of skilled labour; and those countries were now manufacturing very largely avowedly for the supply of the English market. He was himself taking a large number of apprentices, notwithstanding the trouble this involved, and he had established a "home" for them, where as many were housed as the place would accommodate. He had also encouraged, as far as possible, the system of out-door apprenticeship, and he felt confident, if it were properly carried out on a larger scale, it would add greatly to the wealth of the nation in the supply of skilled labour applicable to the various branches of manufacture.

Mr. HENRY COLE, C.B., said he believed he might say, on behalf of himself and his colleagues in the Council, that they would be happy to place an evening at Mr. Hartley's disposal next session for the reading of a paper on this subject if he would be good enough to prepare one, and he had no doubt the matter would then be fully discussed by the Society. The question of skilled labour was an important one, but for his own part he had no dread of workmen getting 10s. a day. With respect to

the Council's report, he hoped it would be considered satisfactory. It was not for the Council to speak in praise of themselves, but he felt that during the past year—thanks especially to the chairman who had acted during that period—they had brought forward one subject in particular of the highest importance to the welfare of this country. They lived in hopes that the legislature would do what lay in its power to enable the labouring classes of the kingdom to be properly housed. He thought the measure to enlarge the area of rating introduced by Mr. Villiers had a most important bearing upon this question, and he hoped this Society would not let the subject drop. One other point in the report he would also touch upon—that of Musical Education. He lived in great hopes that it would not be very long before England would be able to do for musical education what even the Neapolitans did, and what was done in Paris, Brussels, and in most of the large continental cities. This was a subject which it was hardly to be expected the House of Commons would very readily take up and grant a committee upon; the Council, therefore, thought it quite within the province of the Society to appoint a committee on the subject, regarding music, as indeed it had been regarded from time immemorial, as a most important branch of the fine arts. It was satisfactory to know that his Royal Highness the President took a personal interest in this question; and he (Mr. Cole) had no doubt some good would result from this discussion. He would now move that the report and statement of accounts now presented be received and adopted.

Mr. SEYMOUR TEULON had great pleasure in seconding the motion, and, in doing so, begged, as one of the auditors, to bear his testimony to the very admirable manner in which the accounts were kept by the Financial Officer.

Mr. SYMONS wished to know whether the new catalogue of the library had been completed, and, if so, whether it was intended to print it.

The SECRETARY replied that the manuscript copy had been completed for some time, and was available for the use of the members. It had not been thought advisable to go to the expense of printing it.

Mr. COLE quite agreed in the undesirableness of printing the catalogue, inasmuch as in any large library a printed catalogue, though perfect to-day, would be imperfect to-morrow. The fashion of printing catalogues of large libraries was now quite exploded.

Mr. SYMONS remarked that from a cursory view of the accounts it appeared to him that the Society was £1,000 out of pocket during the last year, which he thought would probably be accounted for by the exceptional items of the printing of the Jury Reports and the repairs of the building.

The CHAIRMAN explained that the two heavy items of the Jury Reports of the Exhibition of 1862, and the expenses incidental to the renewal of the lease, and the consequent repair of the premises (amounting to about £2,400) had been discharged without trenching upon the capital to the extent of more than £1,600, showing that, at any rate, they had been spending less than their income in their ordinary expenses.

The report was then unanimously adopted.

The ballot having remained open one hour, and the scrutineers having reported, the Chairman declared that the following members had been elected to fill the several offices. The names in *italics* are those of members who have not during the past year filled the offices to which they have been elected:—

## COUNCIL.

## PRESIDENT.

H.R.H. the Prince of Wales, K.G.

## VICE-PRESIDENTS.

Sir Wm. G. Armstrong.  
*Thomas Baring, M.P.*  
Lord Berners.  
W. H. Bodkin.  
*Sir J. P. Boileau, Bart.*  
The Earl of Caithness.  
Harry Chester.  
Henry Cole, C.B.  
The Earl Granville, K.G.,  
F.R.S.  
*Edward Hamilton.*  
William Hawes.

*C. Wren Hoskyns.*  
Lord Henry Lennox, M.P.  
Lord Lyttelton.  
Right Hon. Sir John S.  
Pakington, Bart., M.P.  
Sir Thomas Phillips, F.G.S.  
The Marquis of Salisbury,  
K.G.  
The Duke of Sutherland.  
Thomas Twining.  
Vice-Chancellor Sir William  
Page Wood, F.R.S.

## COUNCIL.

Professor Bentley.  
D. Robertson Blaine.  
*Stephen Cave, M.P.*  
John Bailey Denton.  
Peter Graham.  
*Henry Maudslay.*

Samuel Redgrave.  
*Rev. W. Rogers.*  
Sir Francis Sandford.  
*Col. Scott, R.E.*  
Geo. F. Wilson, F.R.S.  
Thomas Winkworth.

## TREASURERS.

W. B. Simpson.

| *Seymour Teulon.*

## AUDITORS.

H. Reader Lack.

| *Philip Wright.*

## SECRETARY.

Peter Le Neve Foster, M.A.

## FINANCIAL OFFICER.

Samuel Thomas Davenport.

At the conclusion of the General Meeting a Special Meeting was held, when the following candidates were balloted for and duly elected members of the Society:—

Attwood, J., 61, Cannon-street, E.C.  
Auld, Thomas Reid, 36, Portland-place, W.  
Bruce, James, Inverquhomery, Longside, Aberdeenshire.  
Crawford, Peachey Sowerby, 117, Lupus-street, S.W.  
Graham, William F., Woodberry Down, Stoke Newington, N.  
Green, Squire, 4, Shrewsbury-cottages, Holland-road, Brixton, S.  
Hawkins, Henry, Wallingford, Berkshire.  
Holroyd, Edward, Church-street, Wimbledon, S.W.  
Miller, James Gordon, Financial Insurance Company, 60, King William-street, E.C.  
Moseley, Walker, 17 and 18, King-street, Covent-garden, W.C.  
Payne, Wyndham, 32, Kensington-square, W.  
Roper-Curzon, Hon. Sidney, Grove House, Lower Tooting, S.  
Scarell, Thomas, Beddgelert, Carnarvonshire.  
Sims, Frederic John, Colemore-row, Birmingham.  
Smith, Thomas Roger, 57, Strand, W.C.  
Trotman, John, 42, Cornhill, E.C., and 31, Acacia-road, N.W.  
Walmisley, John Richard Lambert, 5, Victoria-street, Westminster Abbey, S.W.  
Webb, Capt. Sydney, 24, Manchester-square, W.  
Westfield, George John, 5, King-street, Finsbury, E.C.

Mr. SEYMOUR TEULON said this being the last meeting of the Session he thought that, considering the very efficient manner in which the Chairman had discharged the laborious duties of his office, they ought not to separate without passing a cordial vote of thanks to that gentleman for his constant attention to the business of the Society, and for the ability and zeal with which he had presided on so many occasions over their meetings during the past year.

Mr. BARKER had great pleasure in seconding the motion. For some months past he could himself bear testimony to the indefatigable manner in which Mr. Hawes had discharged his duties, not only in this room, but also in connection with the Committee on Labourers' Dwellings, of which he (Mr. Barker) was a member. They were greatly indebted to him for the time he had devoted to the interests of the Society, and for the manner in which he had discharged all the duties connected with his important position.

The motion was carried unanimously, and the Chairman acknowledged the compliment paid to him.

A vote of thanks to the scrutineers terminated the proceedings.

### EXAMINATION PAPERS, 1865.

The following are the Examination Papers set in the various subjects at the Society's Final Examinations, held in April last :—

#### ARITHMETIC.

##### THREE HOURS ALLOWED.

1. Find, by Practice, the value of  $835\frac{1}{2}\%$  articles at £2 13s. 4d. each.
2. The price of iron is 16s. 7½d. per cwt., find the cost of 24 tons, 15 cwt., 2 qrs., 14 lbs.
3. Find the sum, in integers, of £·3125, ·4375s., and ·75d.
4. If 2,240 stones, each 9 in. square, will pave a yard, how many stones will be required to pave a yard twice the size, each stone measuring 14 in. by 12?
5. Convert £540 17s. 6d. into decimal currency, £1 being the unit, and then find its simple interest for 3½ years at 4 per cent. per annum, expressing the answer both in decimal and ordinary currency.
6. Goods were sold for £225 10s. with a gain of 12½ per cent.; what would have been gained or lost per cent. by selling them for £187 10s.? Work by decimal currency.
7. A workman's wages are 1 fl. 3 cents, 4 mils a day, and his expenses are 12s. 6d. a week; what will his savings amount to at the end of a year in common money?
8. Exchange into English decimal coinage 12,687 francs, 50 centimes, the rate of exchange being 25 francs 32½ centimes per pound sterling.
9. If a person whose income is £365 a year spend £8 16s. 3d. a week for the first 20 weeks, to what amount must he limit his daily expenditure for the remainder of the year so as to avoid being in debt at the end of it?
10. Find the insurance at 3 per cent. on a house worth £374, so that in case of fire the insurer may receive the value of the house and premium.
11. Transfer £1,500 of 3 per cent. stock at 90 to the 4 per cents. at 75, and find the difference in the annual income.
12. A merchant bought 24 cwt. of sugar at 5½d. per lb., and sold ¾ of it at 6½d., ¼ of it at 6d., and the remainder at 5½d. per lb., what is his gain per cent.?
13. A tradesman marks his goods with two prices, one for ready money and the other for a year's credit, allowing discount at 5 per cent.; if the credit price is £2 9s., what ought the cash price to be?
14. A has goods worth 30s. which he barter with B at 45s., allowing him 9 months' credit; B rates his exchange at 20s., giving six months' credit. What is the value of B's goods?
15. At a game of skill A can give B 10 points out of 50, and B can give C 10 points out of 50. How many points can A afford to give C out of 50?
16. If oranges can be bought at the rate of 20 a shilling, how many should be sold for £1 8s. to gain 40 per cent.?

17. A, B, and C are partners, A receiving ⅔ of the profits, B and C sharing the remainder equally. A's income is increased £220 when the profits rise from 8 to 10 per cent. Find the respective capitals invested.

18. A merchant purchases wheat at 71s. 6d. a quarter; at what must he sell it to gain 12½ per cent. and allow a purchaser 2½ per cent. discount?

19. What half-yearly dividend is due upon an investment of £2,500 in the Three per Cents at 87½ after deducting 7d. in the pound for income-tax?

20. If 15 men be necessary to excavate 966 cubic yards in 8 days, working 10½ hours daily, how many men would be required to excavate 575 cubic yards in 12 days, working 7½ hours daily, 4 extra men being taken on during the last 4 days?

### BOOK-KEEPING BY DOUBLE ENTRY.

##### THREE HOURS ALLOWED.

1. In what does the difference between single entry and double entry consist, and what is the special advantage possessed by the double entry method?

2. What is the distinctive use of the "Journal" in the Italian system of book-keeping by double entry?

3. What should a profit and loss account exhibit?

4. What should a balance sheet exhibit?

5. Journalize and post in proper technical form and language, the following imaginary facts and transactions, and make out from the ledger, a trial balance, a profit and loss account, and a balance-sheet.

John Long and James Rose begin business in partnership on the 1st January, 1865.

John Long's capital was £2,000 in cash, and James Rose's capital £1,500 in cash and £1,000 in wine.

N.B.—The capital and drawings of the partners are subject to interest at 5 per cent. per annum, and the balance of the profit and loss account is divisible thus:—To John Long *one-third*, to James Rose *two-thirds*.

1865.

Jan. 3. Bought of Tom Styles, wine, duty paid .....	£450	0	0
„ Accepted Tom Styles draft @ two months date .....	450	0	0
5. Lent John Nokes cash .....	300	0	0
7. Sold to W. Box, wine .....	800	0	0
„ Sold to H. Potts, wine .....	250	0	0
„ Received of W. Box, cash on account .....	600	0	0
8. Sold to S. Vix, wine .....	120	0	0
„ Paid cash for office furniture and fixtures .....	105	0	0
9. Received of W. Box, his acceptance @ six months .....	205	0	0
„ Charge W. Box with interest, six months, on £200 .....	5	0	0
12. Shipped on own account and risk to Bombay, wine invoiced at .....	330	0	0
13. Bought wine of J. Styles .....	700	0	0
„ Paid cash to J. Styles on account .....	500	0	0
15. Cash drawn out by James Rose .....	400	0	0
„ Do. do. by John Long .....	100	0	0
„ Bought of C. Aggs, wine .....	830	0	0
16. Received cash, advance on the above shipment to Bombay .....	140	0	0
„ Bought wine for ready money, and paid cash .....	1,150	0	0
„ Accepted C. Aggs draft at three months date .....	500	0	0
Jan. 18. Sold wine to J. Nokes .....	£625	0	0
„ Charge interest to J. Nokes .....	7	10	0
„ Received of J. Nokes his acceptance on account .....	732	10	0
„ Advanced for petty cash .....	20	0	0
20. Sold wine to J. Nokes .....	270	0	0
„ „ J. Dodd .....	860	0	0
23. „ „ R. Kell .....	400	0	0
„ Paid trade charges out of petty cash .....	8	6	

24. Bought wine of N. Scott .....	125	0	0
26. Received of J. Nokes his acceptances	100	0	0
"          "      S. Dodd          "      "	300	0	0
28. Discounted with O. G. & Co. J. Nokes' acceptance for .....	732	10	0
" Received cash of O. G. & Co. ....	705	5	0
" Discount charged by O. G. & Co. ....	27	5	0
30. Paid to N. Scott, W. Box's acceptance .....	205	0	0
31. Stock of wine on hand at cost .....	950	0	0
" Interest on amount drawn out by John Long .....	0	3	4
" Interest on John Long's capital .....	8	6	6
" Interest on amount drawn out by James Rose .....	0	13	4
" Interest on James Rose's capital .....	10	8	4
" Rent due to A. Bone .....	18	10	0
" Salary due to T. Fox .....	25	0	0
" Trade charges paid out of petty cash	9	3	0

## ALGEBRA.

THREE HOURS ALLOWED.

## A.

1. If  $n$  is any integer, show that  $x^n - a^n$  will divide out by  $x - a$ , and find the value of the quotient.

2. If  $A_n - A_{n-1} + A_{n-2} - \dots + A_1 + A_0 = 0$  prove that  $A_n x^n + A_{n-1} x^{n-1} - \dots + A_1 x + A_0$  contains the factor  $x - a$ .

3. Find the value of the continued product of  $a + b + c$ ;  $a + b - c$ ;  $a - b + c$ ;  $a - b - c$ ; and account for the result remaining unchanged when any two letters in it are interchanged, and also for it containing no odd power of  $a, b, \text{ or } c$ .

4. Reduce the fraction  $\frac{a+b}{c+d} + \frac{a-b}{c-d}$  to its simplest form.

5. The provisions of a fort ran out in 30 weeks; it was originally victualled for 60 weeks, but at the end of eight weeks its strength was doubled, and six weeks later 750, fresh men were thrown in. How many men were in the fort at first?

6. Find the square of  $\sqrt{1+c} + \sqrt{1-c}$  and extract the square root of  $1 - (1 - c^2)^{-\frac{1}{2}}$ .

7. If  $a + b, a + c, b + c$ , are in harmonic progression, show that  $a^2, b^2, c^2$  are in arithmetical progression.

8. Solve the equations  $\begin{cases} \frac{x^2}{y} + \frac{y^2}{x} = 18 \\ x + y = 12 \end{cases}$

## B.

9. Express 1865 in the ternary scale of notation. Also in a scale employing only the symbols of zero and plus or minus unity (denoted by 1,  $\bar{1}$  respectively), express the value of 50.

10. Extract the cube root of 990 in ascending powers of  $\frac{1}{100}$  by the binomial theorem, and apply your result to find its value to seven places of decimals.

11. Five sets of three-volumed novels are arranged along a book-shelf; in how many different ways can they be *intermixed*, taking care that the second volume of any one set is always to be found between the first and last volumes of the same set.

## GEOMETRY.

THREE HOURS ALLOWED.

To obtain a First-class Certificate, at least six problems and four propositions must be correctly done; to obtain a Second-class, at least four problems and eight propositions.

1. All the angles made by any number of lines meeting in one point are together equal to four right angles.

2. If two triangles have two sides of the one equal to two sides of the other, each to each, but the angle contained by the two sides of one of them greater than the angle contained by the two sides equal to them of the other, the base of that which has the greater angle shall be greater than the base of the other.

3. Describe a parallelogram that shall be equal to a given triangle, and have one of its angles equal to a given rectilineal angle.

4. If a straight line be bisected and produced to any point, the rectangle contained by the whole line thus produced, and the part of it produced, together with the square on half the line bisected, is equal to the square on the straight line which is made up of the half and the part produced.

5. Draw a straight line from a given point either within or in the circumference, which shall touch a given circle.

6. In a circle the angle in a semi-circle is a right angle; and the angle in a segment, greater than a semi-circle, is less than a right angle; and the angle in a segment less than a semi-circle is greater than a right angle.

7. Describe a circle about a given square.

8. If the sides of two triangles about each of their angles be proportionals, the triangles shall be equiangular to one another, and shall have those angles equal which are opposite to the homologous sides.

9. Similar polygons may be divided into the same number of similar triangles, having the same ratio to one another that the polygons have.

10. If the vertical angle of a triangle be bisected by a straight line which also cuts the base, the rectangle contained by the sides of the triangle is equal to the rectangle contained by the segments of the base together with the square of the line which bisects the angle.

11. If two straight lines be at right angles to the same plane they shall be parallel to one another.

12. If two parallel planes be cut by another plane their common sections with it are parallel.

## PROBLEMS.

1. Construct a right-angled triangle, having given the perimeter and one angle.

2. Bisect a given quadrilateral by a straight line drawn through a given angular point.

3. In any quadrilateral the squares on the diagonals are together equal to twice the sum of the squares on the straight lines joining the middle points of opposite sides.

4. Circles are drawn touching a fixed straight line at a fixed point; show that the tangents at the points where they cut a parallel fixed line, all touch a fixed circle.

5. Given one angle of a triangle, the side opposite to it, and the sum of the other two sides—construct the triangle.

6. Divide a given arc of a circle into two parts, so that the chords of these parts shall be to each other in a given ratio.

7. Trisect a given triangle by lines drawn from a given point in one of its sides.

8. Describe a circle which shall touch a given straight line at a given point, and bisect the circumference of a given circle.

9. Point out how, with a card and pair of scissors, ocular proof may be given of any of these propositions:—

(1) The angles of a triangle are together equal to two right angles.

(2) Parallelograms upon the same base, and between the same parallels, are equal to one another.

(3) The squares on the sides containing the right angle of a right-angled triangle are equal to the square on the other side.

(4) If a straight line be divided into two equal and also into unequal parts, the squares on



the two unequal parts are together double of the square on half the line, and of the square on the line between the points of section.

(To be continued.)

### MUSICAL EDUCATION.

In a recent number of the *Journal of the Musical Union*, Mr. Ella makes the following remarks:—

We would strongly recommend an hour's perusal of a very small volume by Fétis, entitled *Musique mise à la portée de tout le monde*, in which he would find that music is more distinctly both an art and a science, than any other of the fine arts. We have once read, in an English print, that music is not a science! England is the country of liberty, where persons may talk and anonymously write any amount of nonsense; but in France, Germany, or Italy, the arts are better understood, and people are not so easily gulled on such matters.

We earnestly hope that the results of the present committee (the Society of Arts Committee), composed entirely of amateurs, unbiassed by professional interests, will be more successful, and lead to some practical benefit to music and musicians. In no country are musical publications, classical works of the great masters—sacred and secular, instrumental and vocal—so cheap as in England, and in no other country is good musical instruction so dear! A modern edition of the Messiah, the whole of Beethoven's and Mozart's Sonatas, Mendelssohn's Songs without Words, Bishop's Glees, and a thick volume of hymns and chorales cost less money than a couple of pianoforte lessons by a first-rate master! In fact, there are lessons given in London at high prices, by second and third rate pianists, who, in Vienna, Milan, Stutgard, Berlin, Brussels, Munich, and Paris, would be extremely fortunate to obtain half the lowest amount demanded. What is wanted to meet the increasing appetite for good music and for the instruction of youths whose parents are unable to afford them a complete education, is a national academy, with government aid, presided over by an experienced professor of independent means and moral influence, on whose judgment reliance can be placed for the appointment of competent masters in each department. Such a man is to be found in London. Genius belongs exclusively to no country, but talent may be obtained by educating those who are endowed with a natural disposition for music; and we ardently hope that the learned and artistically sympathetic Chancellor of the Exchequer will be able to spare a little of the four millions surplus in aid of the cause of music. A national academy, with one thousand students, well educated, would supply us with competent organists, excellent vocalists, and efficient orchestral and military musicians. As the London mechanic justly observed at the recent meeting in the South Kensington Museum, the competition of foreign schools of gratuitous instruction beats us out of the field. Cold temperaments are found in every country, which neither education nor practice can mould into artistic shape; but a country that has produced poets and dramatists, *nulli secundus*, can assuredly produce musicians? Precocious talents abound in this country, and the reason that these young musicians fail to realise in manhood what they promised in childhood, is simply owing to the want of a cheap and complete education under competent masters, with access to libraries and good practical exhibitions of the art.

What is meant by a complete education includes a knowledge of harmony, counterpoint, composition, instrumentation, musical history, structure and nature of instruments, and the elements of acoustics, requiring, at least, six years studious application. To these acquirements might also be added an acquaintance with modern languages—Italian, French, and German.

### ON THE ACTION OF SILICATE AND CARBONATE OF SODA ON COTTON FIBRE.

By F. CRAOE CALVERT, F.R.S., F.C.S.

I have lately been engaged in investigating a case of injury to goods, which I hope will prove interesting to chemists and manufacturers, from the novelty of the ascertained chemical facts to which the injury is traceable.

A large quantity of blue-dipped indigo cotton goods, with white reserves, were shipped two or three years ago to South Africa, and when opened, some time after their arrival, were found so unsound as to be quite unsaleable, the cotton fibres being so much injured as to give way upon the slightest strain. The goods were, therefore, returned to this country, and placed in my hands to investigate the cause which had produced this damage.

As a large number of bales were returned without having been opened abroad, an excellent opportunity offered itself for selecting a well-defined series of pieces for experiments, and also for judging of the effects of packing on goods generally, when exposed for a long period to the hot and moist atmosphere of tropical climates.

Firstly, on opening the bales, I observed that the boiled-oil cloth which had been employed to protect the goods from external damp, yielded when subjected to a very slight strain, proving that the texture of the cotton fibre had been injured by the oxidation it had undergone, in consequence of its having been saturated with boiled oil.

Secondly, on examining the goods forming the bales, it was found, in every instance, that the outer folds, including the second, and sometimes the third, were stained and dirty, but this did not extend deeper, the inner folds being perfectly free from stain or mildew. These facts show the importance of returning to this country (where claims are intended to be made upon the manufacturers or packers), entire and unopened bales of goods, instead of a few sample pieces, which cannot show the state of the bales, and enable the examiner to speak with certainty as to the cause of injury.

I also ascertained that the rottenness of the fabrics could not have been caused by their having been packed in a damp condition, for the hygrometric moisture of a piece in the centre of a bale did not exceed 8·5 per cent. Further, the goods were carefully examined to ascertain if any mildew could be discovered, which would have occurred if the goods had been packed in a damp state, and which would certainly have developed itself more fully in the interior of the bales than nearer the outside, if damp packing had been the cause. What completely removed from my mind all doubt as to the cause, was that, on carefully examining the pieces composing the bales, I found among the injured pieces, some which were quite sound, and on submitting these pieces to analysis, comparatively with those which were injured, the following results were obtained:—

The sound pieces left only from 0·55 to 0·65 of ash, whilst the injured pieces left 8·29 and 8·59 of ash, the composition of which was as follows:—

	No. 1.	No. 2.
Insoluble silica .....	2·94 .....	3·81
Silica combined with soda.....	2·35 .....	2·53
Soda.....	1·77 .....	1·60
Other salts .....		
Sulphate of soda.....	1·23 .....	0·65
Chloride of sodium .....		
Sulphate of lead, &c.....		
	8·29 .....	8·59

These analyses show that the pieces had been finished with silicate of soda, which had undergone a partial decomposition; while the pieces which left only a few thousandths of ash were found, on further examination, to have been finished in the ordinary way, viz., with amylaceous substances. This induced me to examine more minutely the goods, to ascertain whether it was to the silicate of soda, or to the carbonate of soda, arising

out of its decomposition, that the injury sustained was due; and I was further prompted to carry on this investigation from the fact that at the present time the tendency amongst manufacturers is to weight their goods. It is well known that the risk of mildew is considerably increased in proportion to the weight of size; consequently there is a great inducement to use mineral in preference to vegetable substances for that purpose. I, therefore, trust that the results now published will warn manufacturers of the risk they run in using mineral size without great care and experience. Whilst on this point I may be permitted to give here an insight into the nature of the size often used in Lancashire for sizing the warps of grey calicoes, and, therefore, I give a few of the results obtained at my laboratory.

## ANALYSES OF VARIOUS CLOTHS.

## No. 1.

Mineral matter, principally clay and sulphate of magnesia .....	5.2
Water in excess.....	2.8
Fermented flour.....	10.0
Hygrometric moisture .....	8.0
Fibre .....	74.0
	100.0

## No. 2.

Mineral matter, principally sulphates of baryta and magnesia.....	4.5
Water in excess.....	2.1
Fermented flour.....	11.3
Hygrometric moisture .....	8.0
Fibre .....	74.1
	100.0

## No. 3.

Mineral matter, principally sulphate of soda and clay .....	4.8
Flour .....	10.0
Water in excess.....	4.5
Hygrometric moisture .....	8.0
Fibre .....	72.7
	100.0

## No. 4.

Mineral matter .....	1.24
Water in excess.....	1.74
Fermented flour.....	13.02
Hygrometric moisture .....	8.00
Fibre .....	76.00
	100.00

The above data show that warps are sized with sour flour (viz., flour which has been allowed to ferment for several days or weeks) and various mineral matters, to the amount, irrespective of moisture, of about 15 per cent. There can be no doubt that goods thus sized are extremely liable to mildew, owing on the one hand to the use of fermented flour, or organic matter, in a state of decay, and on the other to the use of clay, which tenaciously retains moisture, and facilitates cryptogamic vegetation when the goods are packed. I may state, *en passant*, that sulphate of magnesia, sulphate of lime, sulphate of baryta, sulphate of soda, and the chlorides of sodium and magnesium are often used, with or without clay, as weighting materials.

On examining the comparative strength of various pieces composing a bale, I observed that the outside folds of the pieces which formed the external parts of the bale (above alluded to as dirty and stained) were comparatively strong when tested against the folds of the same piece which were towards the interior of the bale. I therefore took the same weight of cloth from both classes of folds and submitted them to analysis, with the following results:—

	Interior of bale.	Exterior of bale.
Insoluble silica .....	4.81*	7.08
Silica combined with soda ...	2.53	0.20
Soda .....	1.60	0.47
Other salts .....	0.65	0.55
	8.59	8.30

On examining and comparing these figures, it is at once seen that the stained fold shows a large increase in the amount of insoluble silica, and a corresponding decrease in the amount of silica combined with soda; but, notwithstanding this, the total amount of silica is nearly the same in both classes of cloths. Further, that there is a total disappearance in the stained fold, of 1.13 per cent., or more than two-thirds of the total amount of soda. From these results it would appear that the silicate of soda, when first applied to the goods, contained the whole of its silica in combination with the soda, and that under the influence of the carbonic acid of the atmosphere, the silicate of soda has been decomposed into insoluble silica and carbonate of soda, thereby giving rise to great increase in bulk; whilst in the goods which were protected from an excess of moisture—as towards the interior of the bales,—and also from the action of carbonic acid, there is only a partial decomposition of the silicate of soda. Mr. Walter Crum has kindly suggested, and I believe the view to be correct, that the cotton fibre has, by its organic nature, a cohesive attraction for silica, which enhances the decomposition of the silicate of soda employed to finish and weight the goods.

From these facts we may assume that there were two destructive influences brought to bear upon the cotton-fibre—1st, that of the increase of bulk resulting from the decomposition of the silicate of soda, giving rise to the formation of free silica and carbonate of soda, which exercised a distending and disintegrating action upon the cellular tissue of the cotton fibre, causing it to burst, and necessarily weakening its tensile strength; 2nd, the direct and destructive action of the free carbonate of soda upon the fibre. The latter appears to be the principal cause of injury, for in the external folds we have a more complete decomposition of the silicate, as shown in the above figures, by the increase in the amount of insoluble silica, and at the same time a decrease of the soda, amounting, as previously stated, to more than two-thirds of the total weight.

We shall now trace more in detail this interesting decomposition of silicate of soda, and endeavour to show what had become of the soda which had disappeared. To attain this object a complete series of specimens were obtained from an entire bale, viz.: 1, a piece which formed the outside and was stained; 2, some of the paper employed in wrapping the goods, which was in immediate contact with the stained cloth; and, 3, some of the flax wrapping placed next to the paper and between the latter and the oil-cloth covering above alluded to. The following are the results yielded by analysis:—

	PIECES OF GOODS.		PAPER WRAPPING.		FLAX WRAPPING.	
	No. 1. Inside fold.	No. 2. Outside fold.	No. 3. In contact.	No. 4. Not in contact.	No. 5. In contact.	No. 6. Not in contact.
Insoluble silica .....	4.05	5.65	0.02	0.03	0.04	0.01
Silica combined with soda.....	2.21	0.38	0.09	0.02	0.03	0.03
Soda .....	1.76	0.25	0.85	0.01	0.29	0.02
Other substances ...	1.96	1.91	15.15	15.28	1.19	1.26
Total ash....	9.98	8.19	16.11	15.34	1.58	1.31

In examining these results we have again a most striking and marked difference in the amount of insoluble silica

and soluble silicate of soda in the two different parts of the same cloth; and, further, where the carbonate of soda has been removed, the folds of the cloth remain comparatively sound. As to the paper wrapping, it is evident that the paper in contact with the goods has absorbed a great part of the soda which was previously combined with the silica, and that the soda is partly in the state of carbonate, and partly in combination with some of the organic matter of the brown paper; for when some of the paper was treated with water, it yielded a yellowish brown substance, which coloured the liquid, whilst the part of the same paper which had not been in contact with the goods did not discolour water in any marked degree. Further, the aqueous solution was neutral, and not alkaline, as in the previous case. As to the flax wrapping, the same difference as noted in the paper was observed, viz., that the part of the wrapping in contact with the stained paper and the stained fabric contained carbonate of soda, whilst that which was in contact with the clean paper contained only a trace. In looking over the bales, a piece of cloth was found, which had been finished with silicate of soda, and was partly overlapped by another piece, showing one-half of its exterior fold stained and comparatively sound, whilst that half of the fold which was prevented from forming the exterior of the bale by being overlapped by the previous one was quite tender and rotten, though it showed no signs of any stains or mildew. I also examined a sound piece which had laid in contact with an injured one, and found that in those folds which had been in contact, there was in the injured piece less soluble silicate, and in the folds of the sound piece a considerable quantity of carbonate of soda, the presence of which could not be found in the folds forming the centre of it.

Having observed that the reserved white patterns of the blue-dipped indigo cloth were a great deal more tender than the blue portions of the same piece, I carefully cut out a portion of the white parts and submitted them, with the blue parts, to analysis, with the following results:—

	White.	Blue.
Insoluble silica .....	5.48	3.17
Silica combined with soda...	0.18	2.10
Soda .....	0.78	1.43
Other salts .....	1.08	0.67
Total .....	7.52	7.37

These figures illustrate the fact that the decomposition of the silicate of soda has been carried on to a much greater extent in the white parts than in the blue; and I am led to believe that the cause of the increased rottenness in the white is due to the printer having used a resist-paste too acid, and having found that the whites were slightly tendered, he endeavoured to check the further action of the acid on the cotton-fibre (which, as chemists well know, continues until the cotton fibre is completely destroyed) by the employment of a strong solution of silicate of soda, which, being an alkaline salt, was well adapted to neutralise any acid in the cloth and arrest its action. And as previously only weak solutions of silicate of soda had been employed for this purpose, the printer of these goods could not have foreseen that the use of a more concentrated solution would result in such serious consequences. The above figures also prove another interesting fact, viz., that the white parts of the cloth contain a much larger proportion of silicate of soda than the blues, thus proving that the dyed indigo fibres, being partially filled with this resinous dyeing material, were not in a condition to absorb so largely the silicate of soda.

Messrs. H. Caro and Dancer, who were also employed to investigate this matter, entertain a different opinion as to the cause of the white parts being more injured than the blues. These gentlemen are led to believe from their results that the reason why the whites are more injured than the blues is, that a slow chemical action has ensued between the sulphate of lead remaining from the reserve

paste and the silicate of soda, and that a silicate of lead has been formed, and as this salt occupies a larger bulk than the sulphate of lead previously existing in the fibre, the production of it inside the cellular tissue of the fibre has been the cause of the increased tenderness of the whites. But as these gentlemen are engaged in investigating the question more fully, I shall leave to them the pleasure of publishing their results.

Lastly, I deemed it my duty to make some direct experiments on the action of silicate of soda on cotton fibre. I therefore took some white cotton and dyed a portion of it with indigo. This blue-dyed cloth, with a part of the white one, were dipped in a moderately strong solution of silicate of soda, then dried, and a portion of them introduced into a bottle, at the bottom of which a little water had been placed, and, to help the action of the carbonic acid of the *atmosphere*, a slow current of carbonic acid was then passed through the bottles containing the cloths. After three months' time the warps of these samples were tested, and their comparative breaking weights were found to be as follows:—

	On an average of 10 essays.
The warps of the unsilicated cloth dyed blue...	334
The same silicated .....	299
	264
	289

These results leave no doubt that the warps, even during the short period of three months, had been considerably injured by contact with silicate of soda. In conclusion, I beg to add that I am aware that silicate of soda has been used for finishing coloured goods, but when employed it has been in a very dilute state, and therefore its destructive action has not been sufficiently marked to draw the attention of calico printers.

## Fine Arts.

A LADY KNIGHT.—One of the last acts of the Empress Regent, during the absence of Louis Napoleon in Algeria, was the decoration of the admirable artist, Rosa, or rather Rosalie, Bonheur, who thus becomes *Chevalière* of the Legion of Honour. The cross of the order has never before been conferred upon a woman, with the exception of sisters of charity, members of other religious communities, and *vivandières* who have risked their own lives in performing acts of charity and devotion. Now that the first step has been taken there is little doubt that others will follow. Madame George Sand is by all consent the first writer, the most accomplished romancer, in France, while Madame Henriette Browne and other ladies hold a very high position in the arts. As regards Rosa Bonheur, it is not, perhaps, generally known that that lady belongs to a family of artists: her brother Auguste's landscapes and cattle are deservedly admired; another and younger brother, Jules Isidore Bonheur, is a sculptor, of animals principally, and four of his groups have been rewarded with medals; in the exhibition now open in Paris there are two bulls, modelled by him for the Sultan, which are extremely fine; lastly, Rosa Bonheur has a sister named Juliette, now Madame Peyrol, who is a painter of still-life, and the two ladies have performed good service in the establishment and superintendence of a free drawing school for girls. Moreover, these four artists were all children and pupils of Raymond Bonheur, a painter of merit, who died in 1853. It is not often that the same kind of talent is found thus to mark a whole family.

NATIONAL PORTRAIT EXHIBITION.—The Lords of the Committee of Council on Education have received a letter from the Earl of Derby, suggesting the formation of a National Portrait Exhibition, from which letter the following extracts are made:—"I have long thought that a

National Portrait Exhibition, chronologically arranged, might not only possess great historical interest by bringing together portraits of all the most eminent contemporaries of their respective eras, but might also serve to illustrate the progress and condition, at various periods, of British art. My idea, therefore, would be, to admit either portraits of eminent men, though by inferior or unknown artists, or portraits by eminent artists, though of obscure or unknown individuals. I have, of course, no means of knowing, or estimating, the number of such portraits which may exist in the country; but I am persuaded that, exclusive of the large collections in many great houses, there are very many scattered about by ones and twos and threes in private families, the owners of which, though they could not be persuaded to part with them, would willingly spare them for a few months for a public object." \* \* "The question of one, two, or three exhibitions in consecutive years, would, I apprehend, be mainly decided by the result of future inquiries as to the probable number of pictures which could be obtained, and the space which could be found for their exhibition. But whether the period over which each exhibition (if more than one) should range, be longer or shorter, the point on which I should set the greatest value, in an historical, if not in an artistic point of view, would be the strict maintenance of the chronological series. I shall be very happy if any suggestion of mine should lead the Committee of Council to take up seriously, and carry out, with such alterations of detail as experience might suggest, a scheme which I think could hardly fail of being generally interesting; and I should have much pleasure in placing temporarily at their disposal any portraits from my collection at Knowsley which they might think suitable for their purpose." Their lordships state that they consider these suggestions very valuable, and will carry into effect, in the year 1866, a National Portrait Exhibition generally in accordance with them. They propose to constitute a Committee of Advice, and to invite the Trustees of the National Portrait Gallery to be members of it. Mr. Samuel Redgrave, to whose valuable labours the successful formation of the Collection of Portrait Miniatures is chiefly due, is to be requested to undertake the special charge of carrying this minute into effect.

ARTISTIC EDUCATION IN PARIS.—The Prefect of the Seine appointed a commission, some time since, to inquire into the best means of improving the system of teaching drawing and design in the municipal schools. The commission was presided over by M. Dumas, of the *Institut*, and included amongst its members the Count de Nieuwerkerke, superintendent of Fine Arts, M. Viollet Leduc, architect, M. Gérôme, and other artists. It has just published its report, in which great stress is laid on the necessity for extending the practice of the art of design amongst the population of the capital as a powerful element in industrial success. Considering that the true interests of industrial art cannot be separated from those of pure art, the commission decides that strict examinations shall take place in all the public schools of the city. This list includes all the primary schools, the classes for apprentices and adults, as well as all others which receive a subvention from the municipality. The commission declares the present system of teaching elementary art to be too restricted, and considers special professors absolutely required in order to give the pupils precision of eye, hand, and taste; further, that it is necessary to supply the schools with the best models, to establish special courses of instruction for the various branches of industrial art, and to institute competitions amongst the pupils with the view, not only of stimulating the endeavours, but also of sustaining the zeal of the teachers. The application of the same principles in the case of the female classes is declared indispensable, not only with regard to the cultivation of taste and improvement in industry, but also in a moral point of view, as opening the way for female occupation in those branches of art which do not require physical force but a delicate and tutored hand. In pur-

suance of the views of the commission, Count de Nieuwerkerke has placed at the disposal of the municipal authorities all the casts and engravings in the Louvre which may be available for Art education in the schools. This is only one instance of the many means that are being brought into operation in France to improve the industrial population, and to maintain for the artistic products of Paris that pre-eminence which in many branches they have so long enjoyed; whilst the large number of artists from amongst which professors and teachers may be secured for the schools gives France, and especially Paris, an immense advantage over most of her neighbours and rivals.

## Manufactures.

PLATINUM.—It has lately been asserted in some journals that this metal for the purpose of boiling sulphuric acid is going out of use, owing to being corroded by the hot acid, and that glass is taking its place. It has been further stated that although platinum by itself is affected by the action of this acid, yet that an alloy of platinum and iridium is not acted upon, and that experiments lately instituted have proved these facts. The contrary is really the fact. Platinum is not going out of use, but, on the contrary, is more largely than ever used for this purpose; and where glass has hitherto been used on account of its cheapness it is being replaced by the dearer article platinum, because the latter is found to be more efficient and in the long run less costly. Boilers, after upwards of thirty years' constant work, have been found practically uninjured and as fit for work as the day they were originally put up. As regards the alloy of platinum and iridium being unaffected by the acid, the fact is that it is very readily acted upon, and wherever tried it has failed. Messrs. Crosbe and Blackwell have lately gone to the expense of a platinum steam coil, made of pure platinum tubing, tested to a steam pressure of 60 lbs. to the square inch, to be used by them in boiling the pickling vinegar. This coil is the first of the kind that has been made. It boils 325 gallons of vinegar (the capacity of the vat) in 1½ hours, with steam at 30lbs. pressure. It is made of pure platinum, autogenously soldered. The length of tubing, 1½ inch diameter, consumed, is 32 feet. It was manufactured by Messrs. Johnson and Matthey, at a cost of £800.

ALUMINIUM.—A use seems still to be wanted for this metal, which possesses so many remarkable qualities. At present it is not so much employed in the arts as its very special qualities would warrant. Messrs. Crosbe and Blackwell, the well-known manufacturers of pickles and preserves, have lately had made of this material a large boiler, in which their jams and preserves are boiled. By this means all injury from any contact with copper is avoided, and the aluminium is not attacked by the operation.

SILKWORM DISEASE.—The disease amongst the silkworms, known in France by the name of *La Gâtine*, has become so serious in that country as to amount to a great public calamity, and its importance is increased by the fact that Italy, Spain, Greece, Turkey, Asia Minor, and a part of China are all suffering from the same cause in a greater or less degree. The French Government has, during the last few years, made great efforts to help the unfortunate silkworm rears and mulberry tree growers, but with little success, and the subject has been brought before the Senate in the form of a report, made by the celebrated chemist and senator, Dumas, on two petitions presented to the chamber. One of the petitions is signed by more than three thousand five hundred maires, municipal councillors, and landed proprietors of the Gard and neighbouring departments, whence comes nearly all the silk produced in France. The account given by the petitioners exhibits a state of things far more serious than

was generally imagined. M. Dumas says, in his report, that it is impossible to doubt that the gravity, duration, mysterious character, and effects of the disease are most lamentable. All evidence shows that it attaches to the worm and not to the mulberry leaves; but the breeders have become so impoverished that they cannot purchase the leaves, and there is great danger that the losses of the mulberry growers will cause the trees to be uprooted to make place for some profitable crop. A striking proof of the extent of the evil is to be found in the fact that the *Crédit foncier* and other financial societies decline to make any more advances on mulberry plantations. The extent of the misery which has thus fallen on the unfortunate farmers and breeders of the basin of the Rhone may be conceived from the fact that nine-tenths of all the silk of France comes from that district. The cocoons produced in the empire were valued on an average at a hundred millions of francs, or four millions sterling per annum, and in 1853 the total rose to nearly a hundred and twenty millions. To produce this amount of cocoons eight tons of silkworms' eggs, or seed, as it is called, and six hundred thousand tons of mulberry leaves are required. The ordinary value of the former is set down at three to four millions, and of the latter at fifty to sixty millions of francs. In 1856 the disease had reduced the crop to one-third of the average, and one-half an ordinary crop is now considered a large yield. The loss of the mulberry growers, M. Dumas thinks, has probably not been far short of thirty millions of francs a year. The disease has attacked worms from all countries indiscriminately, with the single exception of those bred from eggs brought direct from Japan. The supply of these latter eggs has been considerable, but not sufficient to revivify the business, and besides, the price is so high that the poor breeders have not the means of purchasing them. The Japanese seed costs from twelve to twenty francs per ounce, whereas formerly French seed cost only one or two francs, and was frequently given away. The petitions have been referred to the Ministers of Agriculture of the Colonies and of Foreign Affairs, and means will doubtless be taken to afford temporary relief to the suffering agriculturists. As regards the eggs, the only way of bringing them to Europe safely is in the ships almost specially devoted to the service, as the cases require to be opened and examined on the voyage, and the presence of any strong smelling commodities in the ship is said to have an injurious effect.

**AGRICULTURAL AND INDUSTRIAL EXHIBITION AT CHAUMONT.**—An agricultural exhibition of the products of the north-eastern departments of France has recently taken place at Chaumont, in the Haute Marne, after an interval of seven years. The horned cattle in the exhibition amounted to 320 heads, amongst which those of the Charolaise race were prominent. These animals, being powerful and precocious, are eminently useful for labour, and their flesh is highly esteemed, but the cows give little milk. The department of the Nièvre alone sends 20,000 beasts to Paris yearly. There were a few Durhams and half-breeds in the show, and a very fine collection of Merino and other sheep, the district being noted for its fine wool. An Industrial Exhibition was inaugurated at the same time, and will remain open till the 20th of July. Chaumont and its neighbourhood are famous, amongst other matters, for cutlery—at Nogent there are eight thousand workmen employed in that trade; also for iron-plate, tools and files of all kinds; the tanneries are extensive, and the glove-trade large and flourishing; cotton and woollen-spinning, wax-bleaching and candle-making, distillation and the timber trade are also extensively developed. There is a large collection of the metallurgical products of the Aube, Isère, Loire, Marne, Meuse, Moselle, Haute-Saône, Vosges, and other departments; a great number of agricultural implements; twenty portable steam-engines; and a variety of objects of general industry and industrial art from all parts of France. The Exhibition is established in a park

belonging to the town, and is contained in twelve large pavilions, surrounded by trees, flowers, and statues. Chaumont is rather more than 150 miles from Paris, on the line of the Eastern railway.

## Commerce.

**PRODUCTIONS OF CORSICA.**—The first general exhibition, which took place lately in Corsica, has been the means of making the resources of that curious island known for the first time to the French public generally. Within the last twelve years the island has been reclaimed from almost a savage state. In 1840 there was but one main road, and no public conveyances; now there nine Imperial and eighteen other main roads, making together 1,744 kilometres, or about 1,000 miles. There are now steamers five times a week, which place the island within twenty hours' journey of Marseilles. The sheep and pigs still, however, maintain rather uncivilised habits, and will not eat in confinement, so that those shown at the exhibition had to be turned loose during the night. The sheep give no wool, but hair, which is made into cord and coarse stuffs for the peasants' winter wear. The olive, vine, orange, citron, almond, fig, and mulberry, flourish luxuriantly in Corsica. There were no less than 250 exhibitors of oil at the late show; and the value of the crop is set down at nearly £160,000 a year. Corsica sends large quantities of oranges, citrons, almonds, and other fruits, fresh and preserved, to Marseilles—the citrons alone amounting to 1,500 tons. The higher mountains are covered with oaks, beech, fir, and other timber trees, which attain magnificent dimensions; the middle region produces chestnuts in a profusion that is to be found nowhere else, and their excessive abundance is cited as one of the causes of the inertness of the rural population. The wooded districts all abound with deer, wild boars, muffsins, and other game; and the Corsican blackbirds are esteemed a great delicacy, and are shipped by hundreds of thousands from Ajaccio, Bastia, and other parts. The mineral productions of the island are, perhaps, better known; the iron works employ about seventeen hundred men, the abundance of wood and the cheapness of sea transport offering great facilities for the trade. The extensive deposits of marble, antimony, copper ore, coal, and other minerals, lie unworked for want of capital. These, together with the cork forests, resinous products, cotton and silk, form the staple of the future prosperity of Corsica, which, in a commercial point of view, must still be regarded as almost in a savage state.

**FLOATING STOREHOUSES FOR INFLAMMABLE SUBSTANCES.**—A slight notice of the new plan of storing dangerous substances, adopted at the new dock and warehouses now being formed at St. Ouen, between Paris and St. Denis, was given in the *Journal* of the 9th of December last. We are now enabled, from personal observation, to furnish particulars respecting the new floating magazines. They consist, in fact, of a series of iron cylinders set up endways, and strapped together, so as to form a huge compound tubular barge. The cylinders, formed of boiler plate, are each about sixteen feet high, and between six and seven feet in diameter; the tops and bottoms being convex, and the former provided with a man-hole. They are arranged in four rows, of twenty-five in each row, and the whole are covered down to the line of flotation with stout planking, which is attached to the cylinders by means of angle-irons rivetted on the latter. The head and stern of these huge floating magazines are provided with hauser-holes for the purpose of towing and mooring them in the basins of the docks. In the case of loading and unloading the magazines may be warped to the dock wall, or the liquids may be pumped in and out from barges. Two of these novel storehouses are now afloat, and two more are nearly finished, as regards the iron-work. As to the docks themselves, a fine square

stone basin, with a surface of 55,000 metres, provided with gates, and also a long and wide canal, are completed, and the iron frame-work of warehouses, six stories high, which will enclose the basin on three sides, is being proceeded with. Immediately in the rear of these three stacks of warehouses are railways, which will bring the latter in direct communication with the Chemin de Fer de Ceinture, which will shortly surround Paris, and which already brings the goods stations of the five great railways in communication with each other.

### Colonies.

**NEW SOUTH WALES FINANCE.**—From the abstract of the sums required to meet the estimated expenditure of the Government of New South Wales for the year 1865, it appears that the total amount chargeable on revenue is £1,484,060 against £1,429,873 appropriated for the year 1864—increase £54,187. The total amount required to be raised by loan, for 1865, is altogether £185,400, against £670,026 for the year 1864. Under the head of special appropriations the amount required for the year 1865 is £391,458, against £341,500 for 1864. This increase of £50,000 is caused by the interest on debentures, which were authorised but only lately issued, and now amounts to £300,000, or £20,000 more than for the year 1864. This will make the debt in debentures actually issued amount to £6,000,000. There is also £16,458 for interest on Treasury bills, and £10,000 for revenue and receipts returned. The total amount required for the year 1865, including loans, is £2,010,918, against £2,441,399 voted for the year 1864.

**INDUSTRIES IN NEW SOUTH WALES.**—A large timber mill has lately been established on the Goulburn river, and is capable of turning out 18,000 superficial feet of timber per week upon ordinary occasions, but, if pressed, can turn out 25,000 feet. The proprietors have erected a wooden bridge across the Goulburn river, which spans the river 250 feet from bank to bank, by a width of 15 feet, with a roadway of 12 feet. Until this enterprising firm had established these works scarcely a woodman's axe had even been lifted in those parts. The timber that is procurable is of a very fine description, and can be procured at almost any length from 5 feet in diameter to 100 feet in length, but the generality used is from 60 to 70 feet in length. Mostly all the timber on the river's bank is of a first-class description, being, unlike most of the colonial timber, very sound.

**TRADE IN MELBOURNE.**—It is stated that a company of Melbourne capitalists intend to place a line of light draught steamers on the Murray to trade between Echuca and the ports up and down the river. These vessels are to draw from 18 to 24 feet of water, and are to be constructed of iron.

### Obituary.

**FRANÇOIS CLEMENT MOREAU.**—A French sculptor, whose admirable statue of Aristophanes obtained a medal, and is one of the most admired productions in the present Paris exhibition of the works of living artists, was carried off very suddenly a few days since by aneurism of the heart. M. Moreau was little over thirty years of age.

### Publications Issued.

**FOREIGN MEASURES AND THEIR ENGLISH VALUES.** By Robert C. Carrington, F.R.G.S., Hydrographical Draughtsman of the Admiralty. (J. D. Potter, Admiralty Chart Agent.)—Contains a systematic arrangement of the measures of all the countries of the world, with their equivalents in English, as well as a detailed explanation

of the metrical system of France, the new decimal systems of Italy, Spain, Portugal, Sweden, &c. The whole work is arranged alphabetically, with a copious index, which also forms a glossary.

**ATLAS CELESTE.** By Ch. Dien. (Paris.)—This work is said to give more than a hundred thousand stars and nebulae in the positions they occupied on the first day of the year, 1860, according to the highest astronomical authorities in Europe, and is preceded by an explanatory introduction by M. Babinet, of the French *Institut*.

**ANNUAIRE DES SOCIÉTÉS SAVANTES DE LA FRANCE ET DE L'ÉTRANGER.** By the Count Achmet d'Hericourt. Two vols., 8vo. (Paris.)—A list of all the learned societies, not only in Europe, but in all quarters of the world, including Oceana.

**DESCARTES, SES PRECURSEURS ET DES DISCIPLES.** By Emile Saisset. 18mo. (Paris.)—The great French philosopher is taken as the starting point, or rather standard, around which M. Saisset has developed his notes and criticisms on the history of philosophy—Bacon, Ramus, Descartes, Spinoza, Malebranche, Leibnitz are the principle figures in the work; but M. Saisset has devoted a large portion of his attention to throwing light on the more obscure portions of Spinoza's philosophy.

**LES ASSOCIATIONS OUVRIÈRES DE CONSOMMATION, DE CREDIT, ET DE PRODUCTION, EN ANGLETERRE, EN ALLEMAGNE ET EN FRANCE.** By Eugène Véron. 18mo. (Paris.)—A small but interesting work on co-operative societies. It has a special value at the present moment, when the Imperial legislature is occupied with a measure for releasing such associations from some of the trammels which now bind them in France.

**LE LIVRE DES OUVRIERS A LA VILLE ET A LA CAMPAGNE.** By H. Huré and J. Picard. One thick vol.; 12mo. (Paris.)—This is a praiseworthy attempt, by two gentlemen of education, one a professor and the other an officer in the library of Sainte-Geneviève, to furnish the working man with a cheap book of reference on almost all subjects. Religion, morals, the duties of workmen and the legislation that specially affects them, reading, writing, grammar, arithmetic, singing, the useful arts, industrial biography, geography, and history are the subjects of the work, which is systematically and not alphabetically arranged.

**GUIDE PRATIQUE DE L'INGÉNIEUR AGRICOLE.** By Jules Laffineur. (Paris.)—Soil, drainage, irrigation, and all the operations which form the basis of scientific cultivation, are treated in this work.

### Notes.

**SOUTH KENSINGTON MUSEUM.**—The Lords of the Committee of Council on Education have appointed a commission to inquire into the warming and ventilation of the galleries containing works of fine art at the South Kensington Museum. The Commission consists of Prof. Graham, Master of the Mint; Prof. Tyndall, Dr. Percy, Dr. Frankland, Colonel Scott, R.E., and Captain Donnelly, R.E.

**ELECTRIC TELEGRAPH.**—Algiers is now connected with France by the electric wire. The price of a message from Algiers or Tunis to Paris is eight francs for twenty words, this being only two francs more than the cost of a similar message from Boulogne to Worthing, which is six francs, that is to say, the same as a despatch from Paris to London.

BREAD of this year's wheat was sold in Paris a few days since; of course this wheat was grown in the Marseilles district, which is actually a southern climate.

### Correspondence.

**SUBAQUEOUS RESPIRATOR.**—SIR,—Not reading the *Journal* with that regularity which its contents deserve, it was

only to day that I perused the article "Respiratory Apparatus," in No. 651. It is there stated that M. Galibert has invented an apparatus for affording a supply of air to persons working under water, &c., that is so much like an apparatus invented by my father, illustrated and described by him in the *Mechanic and Chemist*, November 23, 1839, that nearly every reader will see that there is the same train of thought and reasoning for attaining the same end. Without being biassed in its favour, I think my father's invention would obtain the preference, for he suggested that the air-bag should be filled with a mixture of one-thirtieth more oxygen than ordinary air. The copper bag carried on the back is described by him as containing condensed air, which issues gradually and regularly into the hood. With this apparatus a diver, carrying weights round the waist, which he could release when he wanted to come up, would be enabled to explore for a quarter of an hour together the bottoms of canals, lakes, rivers, &c. In thus writing I do so to claim for my father a priority of twenty-six years in this idea.—I am, &c., CHARLES PRESSE.

Royal College of Chemistry, June 17th.

### MEETINGS FOR THE ENSUING WEEK.

- MON. ...Entomological, 7.  
 Asiatic, 8.  
 Royal Inst., 2. General Monthly Meeting.  
 TUES. ...Ethnological, 8. 1. Dr. Donovan, "Craniology and Phrenology in relation to Ethnology." 2. "Photographs from Central America," communicated by Mr. E. B. Tylor. 3. Professor Bell, "On Visible Speech."  
 FRI. ....Archæological Inst., 4.  
 SAT. ....R. Botanic, 34.

### PARLIAMENTARY REPORTS.

#### SESSIONAL PRINTED PAPERS.

- Par. Num. *Delivered on 26th May, 1865.*  
 344. Railway Trains—Circular of 30th July, 1864, from the Board of Trade.

- Delivered on 14th June, 1865*  
 191. Bills—Companies Workmen's Education.  
 205. " Personages.  
 206. " Crown Suits, &c. (as amended in Committee).  
 207. " Inland Revenue (as amended in Committee).  
 208. " Comptroller of the Exchequer and Public Audit.  
 350. Hampstead Parish—Return.  
 355. Anchors—Return.  
 356. Civil Services—Supplementary Estimate, Class I. Vote 28 (National Gallery Enlargement).  
 North America, No. 5 (1866)—Correspondence respecting the Assassination of the late President.  
 Public General Acts—Cap. 26 to 37.

- Delivered on 15th June, 1865.*  
 211. Bills—Ulster Canal Transfer.  
 212. " Greenwich Hospital (as amended in Committee, and on Re-commitment).  
 300. Valuation of Lands and Heritages (Scotland)—Report.  
 345. East India (Public Works)—Letter.  
 958. Salmon Fishery Act (1861) Amendment Bill—Minutes of Proceedings.

- Delivered on the 18th December, 1865.*  
 200. Bills—Falmouth Harbour.  
 210. " Pier and Harbour Orders Confirmation (No. 3).  
 213. " Penalties Law Amendment (as amended in Committee).  
 214. " Harwich Harbour (as amended by the Select Committee).  
 215. " Fortifications (Provision for Expenses).  
 125. East India (Finance and Revenue Accounts)—Parts I. and II.  
 347. Mails (England and India)—Memorials.  
 359. Lunatics (Ireland)—Return.  
 Births, Deaths, and Marriages—Supplement to the Twenty-fifth Annual Report of the Registrar General.  
 Life Annuities—Tables.  
 Passages on board Her Majesty's Ships "Liffey" and "Phoebe"—Correspondence.

### Patents.

*From Commissioners of Patents Journal, June 23rd.*

#### GRANTS OF PROVISIONAL PROTECTION.

- Axes and other tools—1558—T. Smith.  
 Bonnets and hats, composition used in manufacturing—1442—J. Eustace.

- Carbonaceous substances, distilling—1553—J. Howarth.  
 Cheese-manufacture—1535—P. Coombes.  
 Combustible matters, preventing the ignition of—1515—H. Allman.  
 Dress, machinery for making articles of—399—D. Barr, W. H. Page, J. C. Newey.  
 Economic boiler for hot-water apparatus—1510—F. Knight.  
 Electro-magnetic clocks—1518—R. A. Brooman.  
 Exercising chair for infants—1508—T. Brinamsed.  
 Fabrics, machinery for raising the pile of—1514—W. E. Newton.  
 Fire-arms, breech-loading—1546—G. Haseltine.  
 Fire-engines—1404—J. Shand.  
 Gas meters—1548—H. H. and J. F. G. Kromschroeder.  
 Hand-stamp for printing letters, &c.—1536—A. J. Aspinall.  
 Heat-generation—1559—W. Sim and A. Barff.  
 Hides, tanning—1554—A. O. Henderson.  
 Hydraulic apparatus, &c., construction of cylinders, &c., used in—1505—H. Allman.  
 Inkstands—1434—B. Lawrence.  
 Iron bars, &c., machinery for bending and straightening—1532—C. de Bergue.  
 Lace machines—1512—H. Mallot.  
 Marine engines, actuating slide-valves of—1538—J. Robertson.  
 Measuring the human figure, apparatus for—1528—E. Eastman.  
 Milk, apparatus used when boiling—1520—G. Kent and W. H. West.  
 Motive power—1504—D. Hancock and F. Barnes.  
 Oil-feeders—1556—F. Foster.  
 Printing surfaces, process for producing—1522—F. J. Bolton and H. Matheson.  
 Railway break—1542—F. Tolhausen.  
 Railway signals—1502—H. Martin.  
 Safety apparatus for steam-boilers—1523—J. Shepherd.  
 Screw-propelling apparatus—1118—R. Griffiths.  
 Soap-manufacture—1540—R. A. Brooman.  
 Steel manufacture—1560—J. Ferguson and R. Miller.  
 Submerging telegraph cables—1544—J. Kennedy.  
 Tents and stalls—1315—E. Cordonnier.  
 Turbines—1534—T. Gentie and J. Alimark.  
 Valves—1516—J. Nuttall.  
 Vessels, apparatus for propelling and steering—1481—J. Jopling.  
 Water closets—1364—F. Fletcher.  
 Wool-combing machinery—1550—R. A. Brooman.  
 Yarns or threads, twisting or doubling—1530—W. Townend.

#### INVENTIONS WITH COMPLETE SPECIFICATION FILED.

- Arbutus, obtaining syrups, &c., from the—1649—P. Mipgand.  
 Carriage lamps—1637—W. and W. Howes.  
 Electric signals for railway trains—1609—A. E. Brae.  
 Hygrometric condition of the atmosphere, apparatus for indicating—1610—W. Edison.  
 Vehicles, apparatus for facilitating the traction of—1626—H. A. Bonneville.

#### PATENTS SEALED.

- |                                 |                      |
|---------------------------------|----------------------|
| 3090. E. W. Otway.              | 38. G. A. Buchholz.  |
| 3214. H. Hicklin and C. Pardoe. | 48. C. de Bergue.    |
| 3216. G. Alton.                 | 73. S. S. Brown.     |
| 3217. G. Alton.                 | 225. J. Harrison.    |
| 3221. J. Cleaver.               | 311. F. C. Hills.    |
| 3222. J. R. Breckon & R. Dixon. | 320. W. E. Newton.   |
| 3232. J. Millar.                | 344. W. Sim.         |
| 3233. M. A. Muir & J. Melliham. | 348. W. E. Newton.   |
| 3237. J. Dodd.                  | 406. F. C. Vannet.   |
| 3242. B. Baugh.                 | 409. W. E. Newton.   |
| 3248. H. A. Bonneville.         | 446. C. O. Staunton. |
| 3251. W. H. Brown.              | 1024. S. Wright.     |
| 3255. P. A. Roger.              | 1107. H. Caudwell.   |
| 3258. R. Quin.                  | 1165. C. W. Heaven.  |
| 3259. T. Du Boulay.             | 1258. E. Richardson. |
| 16. T. J. Ashton.               |                      |

*From Commissioners of Patents Journal, June 27th.*

#### PATENTS SEALED.

- |                                       |                                     |
|---------------------------------------|-------------------------------------|
| 3236. T. R. Harding.                  | 27. N. Thompson.                    |
| 3239. W. Naider & A. Belcher.         | 29. W. Watson.                      |
| 3244. E. Perce.                       | 39. T. Pickford.                    |
| 3253. J. Ladley.                      | 50. T. R. chardon and M. D. Rucker. |
| 3256. T. Richardson.                  | 53. G. Reymond.                     |
| 3. M. R. Levenson.                    | 90. R. Tempest.                     |
| 4. E. Bevan and A. Fleming.           | 234. W. Clark.                      |
| 6. J. Smith, jun., and J. Williamson. | 247. S., R., and W. Trulock.        |
| 7. J. Spencer & N. Broomhead.         | 535. J. Starley.                    |
| 9. R. Irvine.                         | 958. G. T. Bouasfeld.               |
| 14. H. Lloyd.                         | 1092. G. T. Bouasfeld.              |
| 26. G. Kent.                          | 1192. J. Bernard.                   |

#### PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

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|---|--|
| 1820. D. Adamson and L. Leigh.            | 1844. H. Ponsonby.                     |
| 1832. H. and J. Davenport.                | 1867. E. H. Huch and F. J. Windhausen. |
| 1828. F. E. Schneider and J. Snider, jun. | 1890. I. Holden.                       |
| 1841. E. Edmonds.                         | 1891. A. A. Croll.                     |

#### PATENTS ON WHICH THE STAMP DUTY OF £100 HAS BEEN PAID.

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|---------------------|----------------|
| 1400. W. E. Newton. | 1463. J. Shaw. |
| 1422. W. E. Newton. | 1464. J. Shaw. |
| 1415. T. Spencer.   |                |